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CASE REPORTS

Posttraumatic hepatic artery pseudoaneurysm presenting as gastrointestinal bleeding

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ABSTRACT

Posttraumatic hepatic artery pseudoaneurysm is a rare, but life threatening condition which should be considered in patients with a history of blunt abdominal trauma who present with abdominal pain or gastrointestinal bleeding. We report a case of a patient with such a pseudoaneurysm discovered five months after a bicycle accident resulting in hepatic rupture that was treated conservatively. The patient presented with fatigue, dizziness, inability to tolerate major exertion and gastrointestinal bleeding. After extensive diagnostic procedures, a right hepatic artery pseudoaneurysm was found. The condition was treated successfully with transcatheter coil embolization.

Key words: blunt abdominal trauma, hepatic artery, pseudoaneurysm, embolization, gastrointestinal bleeding, abdominal pain

Introduction

Posttraumatic hepatic artery pseudoaneurysm is a rare, but life threatening condition. (1) The enteric fistulization of such a pseudoaneurysm is even rarer. (2) The condition should be considered in patients with a history of blunt abdominal trauma presenting with abdominal pain or gastrointestinal (GI) bleeding of unclear origin. Symptoms can occur even years after the trauma. (3,4) We report an unusual case of a patient with a giant posttraumatic hepatic artery pseudoaneurysm which presented as GI bleeding, without detectable enteric fistulization, five months after a bicycle accident.

Case report

A 46-year old man was referred to hospital because of fatigue, dizziness and inability to tolerate major exertion. He also reported one black stool three days prior to admission. The patient had a history of smoking and chronic alcohol abuse and was not on any prescription medication. His medical history was remarkable for a bicycle accident that occurred five months earlier which resulted in a mandibular and clavicular fracture, chest contusion and hepatic rupture that was treated conservatively. During the physical examination he was pale, with a heart rate of 60 bpm and arterial blood pressure of 120/70 mmHg. The abdomen was soft, without tenderness or any obvious masses. On digitorectal examination fresh blood was found. Laboratory data on admission revealed severe normocytic anemia (red blood cell count 1,71 x 10^{12}/L, hemoglobin 49 g/L, hematocrit 0,159%, mean corpuscular volume 92,7 fL), as well as elevated gamma- glutamyltransferase (599 U/L) and creatine kinase (297 U/L) levels. Other laboratory parameters were within normal range or not significantly altered. The initial B-mode abdominal ultrasound showed an enlarged liver with a cystic formation in the right liver lobe, around 80 mm in diameter, classified as a hematoma. Upper GI endoscopy indicated no abnormalities. The patient was treated with transfusions of deplasmatized eryt-

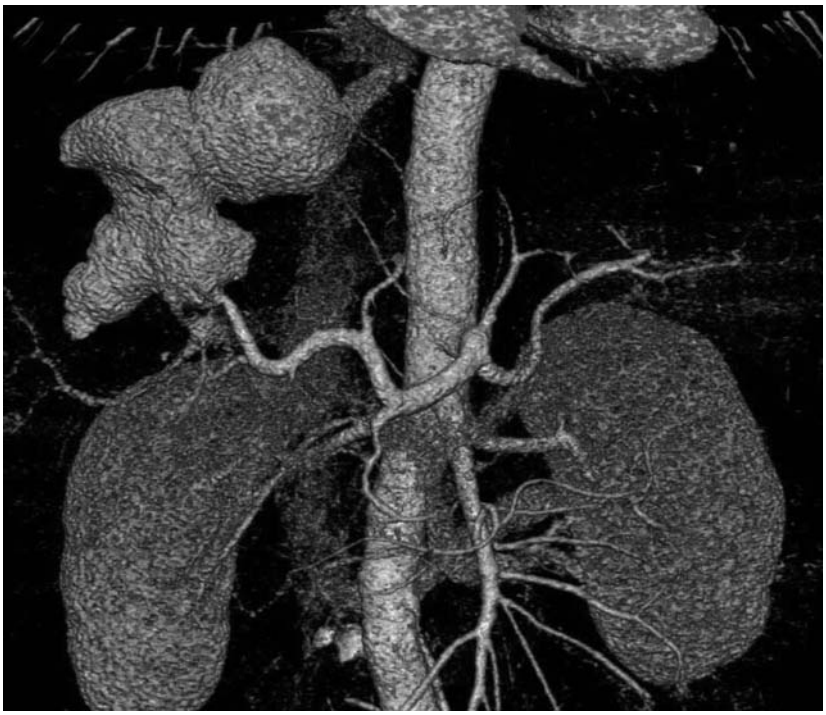

Figure 1. Volume rendering technique (VRT) computed tomography showing giant posttraumatic pseudoaneurysm of the right hepatic artery.

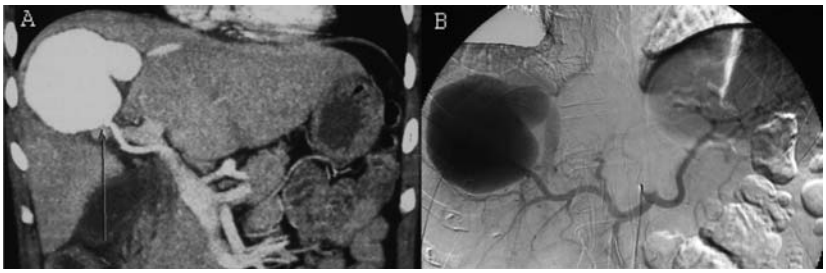

Figure 2. A Multidetector computed tomography 2D reconstructions showing fast flow into the portal circulation in the late arterial phase suggesting a communication between the pseudoaneurysm and portal veins.
B Giant pseudoaneurysm confirmed on digital subtraction angiography prior to embolization.

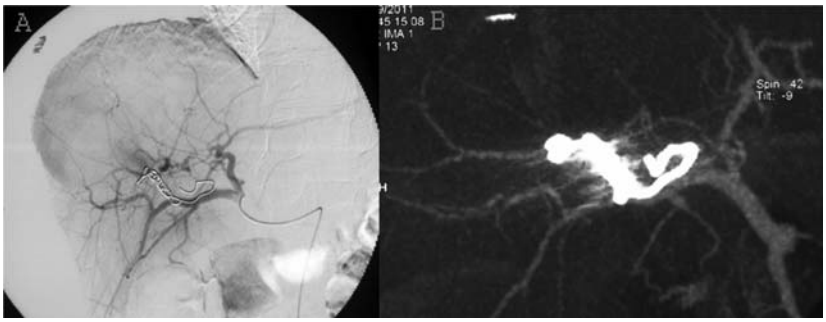

Figure 3. A Digital subtraction angiography following embolization showing almost complete absence of contrast filling of the pseudoaneurysmal sac.
B Multidetector computed tomography reconstruction two weeks following embolization showing complete occlusion of the pseudoeneurysmal sac.

hrocytes, proton pump inhibitors and antibiotics. On the third day of hospitalization the patient became febrile with an axillary measured body temperature of 38.8°C and started complaining of pain in the right upper abdominal quadrant. Laboratory data at that time revealed an elevated white cell count (28.11 x 10^9/L), rise in aspartate – aminotransferase (48 U/L) and alanine – aminotransferase (148 U/L), as well as high C-reactive protein (164,7 mg/L), and CA 19,9 (363,36 U/mL) values. Severe anaemia was still present despite ongoing treatment. Coagulated but also freshly hemolysis blood was observed during colonoscopy with no clear source of bleeding. To further elucidate the possible site of GI bleeding, an abdominal multidetector computed tomography (MDCT) of the abdomen, with intravascular application of contrast media, was performed. There were no signs of bowel wall bleeding but a giant pseudoaneurysm (10x8 cm in diameter) of the right hepatic artery was discovered (figure 1). MDCT 2D reconstructions also revealed fast flow into the portal circulation in the late arterial phase of imaging suggesting a communication between the pseudoaneurysm and segmental portal vein (figure 2A). We hypothesized that the high pressure in the portal circulation was causing occasional bleeding from different sites of the enteric wall. This žhemodynamic changes' hypothesis would be able to explain the episode of black stool and the episodes of fresh blood in the colon. In consultation with a vascular surgeon and interventional radiologist it was concluded that the treatment of choice would be pseudoaneurysm transcatheter embolization. (5-8) A giant pseudoaneurysm was confirmed by digital subtraction angiography (DSA) (figure 2B). Segmental embolization was successfully performed with five complex helical 8x12 mm coils (Boston Scientific Corporation, Pl. Natick, MA; USA) (figure 3A). One 10x14 mm helical coil was also deployed but it was too wide for the segmental artery and it was deployed into the right hepatic artery. Control abdominal MDCT two weeks after the procedure showed no

further circulation towards the pseudoaneurysm and segmental portal vein (figure 3B). Apart from the above mentioned embolization, the patient was treated with repeated transfusions of deplasmatized erythrocytes and fresh frozen plasma, intravenous antibiotics (ceftriaxone and metronidazole), proton pump inhibitors, analgesics and anxiolytics. He was discharged 29 days after admission in good condition with all laboratory values within normal range or not significantly altered.

Discussion

Because of its size and relatively fixed position, the liver is an organ which is very prone to injury when patient suffers blunt trauma to the abdomen. The estimated prevalence of this kind of injury, in polytraumatised patients, is 1-8%. (9) In the early 1970s, more than 80% of liver injuries were managed operatively, but by the end of the 1990s, 80–90% of these injuries were successfully managed using non-operative methods. (10) The reported prevalence of complications during this kind of treatment of blunt liver trauma ranges from 5% to 23%. Of the delayed complications, hemorrhage is the most frequent ranging from 1.7 – 5.9%. Others include abscess, posttraumatic pseudoaneurysm and hemobilia, while biliary complications such as biloma and bile peritonitis are more common in patients with severe, complex liver injuries. (11) Posttraumatic hepatic artery pseudoaneurysm is a rare delayed complication. (12) No information on actual prevalence can be found in the literature as it has only been reported in the form of case reports. The majority of these case reports refer to blunt abdominal trauma in children rather than adults. We can assume that this could be related to children having thinner abdominal walls and weaker musculature so the liver is less protected than in adults. As was the case with our patient, diagnosis is typically delayed, because of non-specific clinical manifestations. The most frequent complaint is right upper abdominal pain, but the condition may also present as unexplained upper gastrointestinal bleeding, hemoperitoneum, hemobilia, jaundice, and abdominal mass. If gastrointestinal bleeding is present, endoscopy is usually not helpful in identifying the source of bleeding. Abdominal ultrasound is usually the first screening method for right upper quadrant abdominal pain and in combination with color Doppler can be helpful in raising suspicion of the presence of a hepatic artery pseudoaneurysm. (13,14) Diagnosis can be confirmed by MSCT or magnetic resonance angiography, (11,13,14) while the gold diagnostic standard is still conventional DSA. (15) Although earlier reports on this topic suggested that surgical ligation of the hepatic artery should be performed, authors of more recent studies agree that the treatment of choice, for hemodynamically stable patients with this condition, is endovascular coil embolization. (15)

In conclusion, although very rare, a posttraumatic pseudoaneurysm of the celiac trunk arteries should be considered in cases of abdominal pain and/or gastrointestinal bleeding presenting after blunt abdominal trauma. Diagnostic approach should include abdominal ultrasound, preferably with Doppler ultrasound, abdominal MDCT with intravenous contrast agent and DSA in cases when embolization is the treatment of choice.

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